

REMARKS

Claims 1-10 and 14-16 are pending in this application. For purposes of expedition, claims 11-13, withdrawn from consideration, have been canceled without prejudice or disclaimer. Claims 1-10 have been amended in several particulars for purposes of clarity and brevity that are unrelated to patentability and prior art rejections while claims 14-16 have been newly added to replace the canceled claims 11-13 in accordance with current Office policy, to alternatively define Applicants' disclosed invention and to assist the Examiner to expedite compact prosecution of the instant application.

Claims 1-10 have been rejected under 35 U.S.C. §103(a) as being unpatentable over newly cited art, Schmidt et al., 4,683,505, in view of Kuno, U.S. Patent No. 5,572,382 for reasons stated on pages 3-5 of the Office Action (Paper No. 7. Specifically, the Examiner asserts that Schmidt '505 allegedly discloses all features of Applicants' claims 1-10, except for "measuring the difference between the outer diameter of the hub and the inner diameter of the disc and pressing back the disc to a half of an amount of tolerance between the inner diameter of the disc and the outer diameter of the hub" which is alleged disclosed by Kuno '382, on FIGs. 4A-4B; column 6, lines 54-58.

However, the Examiner's assertions are incorrect. The newly cited art, Schmidt '505 does **not** disclose what the Examiner alleges. Moreover, even assuming that Schmidt '505 discloses what the Examiner alleges, the subject matter of Kuno '382 is **not** compatible with Schmidt '505 and, if incorporated into Schmidt '505 in the manner proposed by the Examiner, the proposed incorporation will not arrive at Applicants' claims 1-10. As a result, Applicants traverse the rejection and

respectfully request the Examiner to reconsider and withdraw this rejection for the following reasons.

First of all, for purposes of expedition, claims 1-10 have been amended to further clarify that the two flat members 4, 7, as shown in FIG. 1 and FIG. 3, arranged in parallel on opposite sides of a disc relative to a center axis of the hub, have flat surfaces that are used to press evenly against the outer circumferential edge of the disc. The use of such flat surfaces is advantageous because the eccentricity of the disc can always be efficiently corrected even if the hub and the flat members are roughly positioned on the X-Y plane. In other words, since the flat member has a flat surface in contact with an outer circumferential edge of the disc, the eccentricity of the disc in the Y-direction can be corrected by pushing the disc in the Y-direction on the X-Y plane from the X-direction and, likewise, the eccentricity of the disc in the X-direction can be corrected by pushing the disc in the X-direction on the X-Y plane from the Y-direction.

Notwithstanding the fact that Schmidt '505 uses a registration arm 50 and a registration plunger 58, as shown in FIG. 2, for a different purpose, i.e., to diametrically offset multiple discs mounted on a hub as a function of the diameters of the multiple discs relative to a desired diameter, neither the registration arm 50 nor the registration plunger 58 has any flat surface that is positioned to press evenly against an outer circumferential edge of the disc in the manner defined by Applicants' claims 1-10. This is because the registration arm 50, as shown in FIG. 2 of Schmidt '505 uses two registration contact points 52 and 54, in which the registration plunger 58 is then used to drive the disc against the two registration contact points 52 and 54. Such contact points 52 and 54 are frequently ineffective to

position the disc relative to a center of the hub, because the contact points 52 and 54 must be strictly positioned correctly in the X-Y plane in order to correct the eccentricity of the disc.

As amended, Applicants believe that claims 1-10 are clearly patentable over the Examiner's proposed combination of Schmidt '505 and Kuno 382, and that the outstanding rejection is now moot.

To the extent that the rejection may still be applicable, Applicants traverse the rejection for reasons discussed herein below.

Claims 1-10, as now pending, define a method of assembling a disc in a disc apparatus using two parallel flat members having flat surfaces arranged on opposite sides of the disc, as shown in FIG. 1, so as to center the disc relative to a spindle motor hub. The disc is automatically centered using the first and second flat members 4 and 7 in the manner, as shown in FIG. 3.

For example, independent claim 1 defines a method of assembling a disc in a disc apparatus comprising:

mounting a disc onto a hub of a spindle motor in a disc apparatus in a state capable of being moved with respect to the hub of the spindle motor in a direction of a disc radius;

pressing an outer diameter of the disc in a direction of a center axis of the hub by a first flat member so as to bring an inner circumferential edge of the disc into contact with an outer circumferential surface of the hub;

pressing back the outer circumferential edge of the disc contact with the first flat member and the outer circumferential edge of the disc at an opposite position to the center of the disc in an inverse direction to a pressing direction of the first flat member to a half of an amount of tolerance between the inner circumferential edge of the disc and the outer circumferential surface of the hub, by a second flat member arranged in parallel to the first flat member and in an opposite side to the center axis of the hub; and

fixing the disc to the hub of the spindle motor by a clamp member.

Alternatively, independent claim 2, for example, defines a method of assembling a disc in a disc apparatus, comprising:

mounting a disc onto a hub of a spindle motor in a disc apparatus in a state capable of being moved with respect to the hub of the spindle motor in a direction of a disc radius;

pressing an outer circumferential edge of the disc in a direction of a center axis of the hub by a first flat member so as to bring an inner circumferential edge of the disc into contact with an outer circumferential surface of the hub;

pressing back the outer circumferential edge of the disc contact with the first flat member and the outer circumferential edge of the disc at an opposite position to the center of the disc in an inverse direction to a pressing direction of the first flat member by a second flat member arranged in parallel to the first flat member in an opposite side to the center axis of the hub until the outer circumferential surface of the hub and the inner circumferential edge of the disc are in contact with each other, and measuring a difference between the outer circumferential surface of the hub and the inner circumferential edge of the disc;

pressing back a half of the difference between the outer circumferential surface of the hub and the inner circumferential edge of the disc by the first flat member; and

fixing the disc to the hub of the spindle motor by a clamp member.

As expressly defined in Applicants' claims 1-10, the two parallel flat members having flat surfaces are used to press the disc against the hub so that the disc can be accurately and reliably centered. This feature is importantly because previously known equipments such as those described by Kuno '382 typically use pneumatic pressure to align the disc relative to the hub, which are susceptible to errors and unbalance of rotation since the hub can be deformed or impacted due to heating and cooling operation. See pages 2-3 of Applicants' original specification.

In contrast to Applicants' claims 1-10, the newly cited art, Schmidt '505 discloses a disk pack assembly as shown in FIG. 1, using tools such as a multiple set of registration arms 50, 60, 70 and registration plungers 58, 68, 88 used to alternately center the disks 8, 10, 11, as well as registration arms 90, 91, 92 and

registration plungers 94, 95, 96 used to alternately center the spacers 23, 24, 25.

The purpose of Schmidt '505 is to alternately diametrically offset the disks and spacers about the spindle hub so that imbalance moments caused by variations in mass distribution about the spindle axis in the disks from a nominal sized disk are spread out over an increased number of axial nodal points to minimize the amplitude of the associated vibration. See column 4, lines 25-30 and lines 35-47 of Schmidt '505.

In order to achieve this purpose, Schmidt '505 uses a series of registration arms positioned at different reference points to ensure proper mass offset. For example, 1st registration arm 50 having two contact points 52 and 54, as shown in FIG. 2, is positioned at a reference point. A corresponding registration plunger 58 is then used to push or drive the disk 8 against the two registration contact points 52 and 54 of the 1st registration arm 50 at that reference point. Once the disk 8 is pushed against the two registration contact points 52 and 54, positioned at that particular reference point, a next registration plunger 68 is used to push or drive another disk 9 against the two registration contact points 62 and 64 of another registration arm 60 positioned at another reference point. This way mass offset can be achieved.

According to Schmidt '505, the registration arms 50, 60, 70 are alternately positioned at a fixed location at opposite ends of the spindle hub 37. The registration plungers 58, 68, 78 are then used to push or drive disks 8, 9, 10 of different sizes against the contact points of the registration arms 50, 60, 70. Because the registration arms 50, 60, 70 are positioned differently, the overall mass distribution

can be balanced because the disks are now alternately diametrically offset about the spindle hub 6.

However, Schmidt '505 does **not** disclose or suggest any process of pressing an outer circumferential edge of the same disc back and forth as mistakenly believed by the Examiner. For example, Schmidt '505 does **not** disclose or suggest the step of "pressing back the outer circumferential edge of the disc contact with the first flat member and the outer circumferential edge of the disc at an opposite position to the center of the disc in an inverse direction to a pressing direction of the first flat member by a second flat member arranged in parallel to the first flat member in an opposite side to the center axis of the hub until the outer circumferential surface of the hub and the inner circumferential edge of the disc are in contact with each other, and measuring a difference between the outer circumferential surface of the hub and the inner circumferential edge of the disc" as expressly defined in Applicants' base claims 1, 2, 5 and 6, and as mistakenly believed by the Examiner.

More importantly, Schmidt '505 does **not** disclose or suggest the use of two flat members 4 and 7 having flat surfaces, as shown in FIG. 1 and FIG. 3 of Applicants' disclosed invention, arranged in parallel on opposite sides of a disc relative to a center axis of the hub, that are used to press evenly against the outer circumferential edge of the disc. The use of such flat surfaces is advantageous because the eccentricity of the disc can always be efficiently corrected even if the hub and the flat members are roughly positioned on the X-Y plane.

Kuno '382, as a secondary reference, does **not** remedy the noted deficiencies of Schmidt '505 in order to arrive at Applicants' claims 1-10. This is because Kuno '382 discloses nothing more than the previously known equipments used to fit such a

disc relative to a rotor using **pneumatic pressure**. Specifically, on column 6, line 33 extending to column 7, line 19, Kuno '382 discloses that,

“the magnetic disk 16A is fitted onto the rotor yoke 11 in a manner such that the yoke 11 is in its center hole 16a. This operation can be automatically performed by holding the magnetic disk by **air suction using an automatic fitting machine** (not shown). More specifically, a hatched portion of the magnetic disk 16A, as shown in FIG. 4A, is held by air suction by means of the fitting machine, and the disk 16A is fitted on the outer periphery of the rotor yoke 11...

Then, the air suction by the automatic fitting machine is removed. When these processes are executed, centering the magnetic disk 16A is finished, and the disk 16A is mounted on the rotor yoke 11 in a manner such that the gap between the inner circumferential edge of the disk 16A and the outer circumferential surface of the yoke 11 is uniform throughout the circumference...”

As can be seen from the cited portion, and FIGs. 4A-4E of Kuno '382, the disk is centered using well-known equipments utilizing **pneumatic pressure** to align the disc relative to the hub. However, these equipments are susceptible to errors and unbalance of rotation since the hub can be deformed or impacted due to heating and cooling operation. Again, if **pneumatic pressure** is used in the manner described by Kuno '382, then there is **no reason or motivation** for any one to utilize flat members having flat surfaces provided to press the disc back and forth in the manner defined in Applicants' claims 1-10.

In order to establish a *prima facie* case of obviousness under 35 U.S.C. §103, the Examiner must show that the prior art reference (or references when combined) must teach or suggest all the claim limitations, and that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skilled in the art, to modify the reference or to combine reference teachings, provided with a reasonable expectation of success.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and **not** based on Applicants' disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP 2143. In other words, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Moreover, "obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." ACS Hospital System, Inc v. Montefiore Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). The Examiner must point to something in the prior art that suggests in some way a modification of a particular reference or a combination of references in order to arrive at Applicants' claimed invention. Absent such a showing, the Examiner has improperly used Applicants' disclosure as an instruction book on how to reconstruct to the prior art to arrive at Applicants' claimed invention.

Furthermore, any deficiencies in the cited references cannot be remedied with conclusions about what is "basic knowledge" or "common knowledge". See In re Lee, 61 USPQ 2d 1430 (Fed. Cir. 2002).

In the present situation, neither Schmidt '505 nor Kuno '382, discloses or suggests key features of Applicants' claims 1-10. Moreover, in view of the foregoing explanation and the noted deficiencies of Schmidt '505 and Kuno '382, Applicants respectfully request that the rejection of claims 1-10 be withdrawn.

Claims 14-16 have been newly added to replace the canceled claims 11-13 to alternatively define Applicants' disclosed invention over the prior art of record. These claims are believed to be allowable at least for the same reasons discussed against all the outstanding rejections of the instant application. No fee is incurred by the addition of claims 14-16.

In view of the foregoing amendments, arguments and remarks, all claims are deemed to be allowable and this application is believed to be in condition to be passed to issue. Should any questions remain unresolved, the Examiner is requested to telephone Applicants' attorney at the Washington DC area office at (703) 312-6600.

INTERVIEW:

In the interest of expediting prosecution of the present application, Applicants respectfully request that an Examiner interview be scheduled and conducted. In accordance with such interview request, Applicants respectfully request that the Examiner, after review of the present Amendment, contact the undersigned local Washington, D.C. area attorney at the local Washington, D.C. telephone number (703) 312-6600 for scheduling an Examiner interview, or alternatively, refrain from issuing a further action in the above-identified application as the undersigned attorneys will be telephoning the Examiner shortly after the filing date of this Amendment in order to schedule an Examiner interview. Applicants thank the Examiner in advance for such considerations. In the event that this Amendment, in and of itself, is sufficient to place the application in condition for allowance, no Examiner interview may be necessary.

To the extent necessary, Applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage of fees due in connection with the filing of this paper, including extension of time fees, to the Deposit Account of Antonelli, Terry, Stout & Kraus, No. 01-2135 (Application No. 500.40538X00), and please credit any excess fees to said deposit account.

Respectfully submitted,

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